Illinois Department of Transportation
2300 South Dirksen Parkway / Springfield, Illinois / 62764

Subject:
Guidelines for Pumping of Bridge Deck Concrete

CONSTRUCTION MEMORANDUM NO. 00-74

Effective **April 14, 2000**

Expires **Indefinite**

The purpose of this memorandum is to provide guidelines for the placement of bridge deck concrete with concrete pumps. This memorandum supercedes 95-74 dated December 15, 1995.

1. MIX DESIGN

   a. The mortar factor shall not exceed 0.83.

   b. When the atmosphere or concrete temperature is 18°C (65° F) or higher, retarding and high range water reducing admixtures in accordance with Article 1020.05 (b) shall be used.

2. PLANT AND PROPORTIONING

   a. The Standard Specifications require mix water to be added at the concrete plant. If continuous adjustments in water are required, the proportioning technician shall be notified so that appropriate adjustments can be made at the plant. When it is necessary to add water at the jobsite, 40 additional revolutions at mixing speed shall be required on the mixer.

   b. When admixtures are added to the truck mixer at the jobsite, the manufacturer's recommendations for mixing should be followed unless indicated otherwise by the specifications. When an admixture is added at the jobsite, the concrete batch shall be mixed a minimum of 40 additional revolutions after each addition.

   c. Concrete which is significantly modified at the jobsite, after testing, shall be retested for acceptance.

3. PLACEMENT

   a. A prepour conference should be held with the Contractor, Concrete Supplier and materials personnel to discuss proportioning, delivery and method of placement.

   b. The mortar used to provide initial lubrication for the pump line shall be wasted. The wasted mortar shall not be placed in any existing stream or drainage way.

c. When a horizontal pump line is used, a protective cover shall be placed under each joint to prevent spillage of concrete onto the reinforcement bars and deck forms when the sections of the pump line are removed during placement. The protective covering also serves to protect the epoxy coating.

d. When a boom-type pump is used, one of the following shall be attached to the discharge end of the pump conduit to prevent vertical free fall of the concrete:

1. An “S” shaped configuration of flexible or rigid conduit.

2. A “90 degree” elbow with a minimum of 10 feet of flexible conduit placed parallel to the deck.

3. Other similar configurations approved by the Engineer.

When reviewing similar configurations submitted by the contractor, keep in mind that the purpose is to prevent segregation of the mix, minimize concrete air loss, and reduce the potential for damage to the epoxy coated reinforcement. The concrete should look like tooth paste as it comes out of the tube.

e. The pump hopper should be located at an elevation lower than the elevation of the truck discharge. This can be accomplished by constructing a ramp for the trucks or by excavating the area where the pump is located. The difference in elevation allows for the proper discharge of the concrete mix without the addition of water.

f. Water shall not be added to the pump hopper. If water is added to remove a line blockage, the concrete shall be wasted.

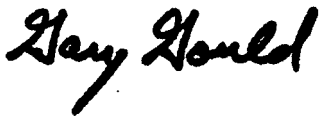
g. The use of aluminum pipes or other aluminum accessories that come into contact with the concrete shall not be allowed.

4. TESTS

a. The slump may be adjusted at the jobsite when required to improve workability of the concrete mix provided the water/cement ratio is not exceeded. If continuous adjustments are required, the proportioning technician shall be notified so that the appropriate adjustments can be made at the plant.

b. Air tests shall be taken for each load. A correction factor shall be established to allow for a loss of air content during transport. The first three truck loads delivered shall be tested, before and after pumping, to establish the correction factor. Once the correction is determined, it shall be rechecked after an additional 40 m^3 (50 cu. yd.) is pumped. This shall continue throughout the pour. If the re-check indicates the correction factor has changed, a minimum of two truck loads are required to re-establish the correction factor. The correction factor shall also be re-established when significant changes in temperature, distance, pump arrangement, or other factors have occurred. If the correction factor is 3.0 percent or more, the Contractor shall take

corrective action to reduce the loss of air content during transport by the pump. When the correction factor indicates that the air content at the pump hopper will exceed specification limits, subsequent air tests shall be made at the end of the pump discharge line to ensure that the correction factor remains valid and that the concrete being placed is within specification limits. The IDOT inspector or contractor shall record all air content test results, correction factors, and corrected air contents. The corrected air content is to be reported on form MI 654.



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